

# Leo Yu-Heng Xie

Grade 12 International Baccalaureate | [leoxie080808@gmail.com](mailto:leoxie080808@gmail.com)

Personal website: <http://leoxie080808.github.io>

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## **SKILLS SUMMARY**

- Leadership
- Mechanical and electrical skills and knowledge
- Coding experience since 2017
- 3 years of summer job work experience
- Numerous robotics competition experience, including Vex VRC & FIRST since 2018
- Self motivated and fast learner

## **PROJECTS**

**Vex Robotics Competition Robot** | X-drive chassis with odometry algorithm Jan. 2021 - Present

- Designed and built special X-drive for custom irregular robot movements
- Implemented advanced optical sensor system for color and object distance detection
- Applied vision system sensors for object tracking and following
- Built tracking encoders for odometry, gyro and inertial sensors for heading correction

**Hidden** | Pen-shaped device to destroy inked QR/bar code Sep. 2020 - Feb. 2021

- Created a device to destroy inked codes on shipping labels to protect private information using special thermal tip
- Designed with a main control system using ARM Cortex M0 & current control system
- Implemented a temperature control system using thermal fuse, temperature sensors and smart chips
- 3-D Printed design of the device exterior shell

**Dual Rehabilitation Robot** | Upper and lower limb recovery robot Apr. 2020 - Present

- Implemented a market ready rehabilitation robot as a developer assistant of mechanical improvements for Dr. Robot Inc. along with University of Western Ontario & CSTAR

**Portella** | Knee joint rehabilitation equipment Aug. 2019 - Feb. 2020

- Utilized EMG technology to detect muscle-nervous signals that direct electrical motor movement along with AI programming algorithms
- Improved the effectiveness and intensity of rehab treatment after knee joint replacement surgery

**Cleaner Robot** | The practical solution of the geese excrement Jan. - Apr. 2018

- Created a cleaner robot to detect and dispose of geese excrement within local community
- Implemented distance sensors, and camera vision with Raspberry Pi

## **LEADERSHIP EXPERIENCE**

**Club Founder**, LeRoi Robotics Vex Robotics Competition Team 81208X Jun. 2018 - Present

- Managed the whole process of the club, including recruitment, designing and building the robot, programming, outreaching, and arranging competitions annually
- Oversaw the editing of Engineering Notebook prepared for each competition
- Mentored rookie teams 18068A in 2019-2020
- Mentored rookie team 81208G in 2020-2021, qualified to the 2021 World Championships

**Club Director, St. Robert CHS Robotics Club**

Sep. 2019 – Jun. 2020

- Managed the club's routines, taught the competition game rules, led the design and build of the robot, mentored programming and engineering notes process, and conducted the entire outreach process
- Led the team as Team Captain to win Inspire Award at the 2020 FTC Ontario Championship

**Executive Member, St. Robert CHS Robotics Club**

Sep. 2018 - Jul. 2019

- Led programming sub-team, and oversaw design and build of competition robots
- Mentored new club members

**Executive Member, St. Robert CHS DECA Club**

Sep. 2019 - Present

- Trained and prepared the entire written cluster as the current trainer to compete at the 2021 DECA Ontario Championships

**Executive Member, St. Robert CHS STEM Council**

Sep. 2020 - Present

- Prepared materials for promotion
- Discussed with various school clubs and councils for collaboration events

***PROGRAMMING SKILLS***

- Python, Java, C++, C#
- [JavaScript, HTML, and CSS for web development](#)
- [TensorFlow for machine learning](#) and [OpenCV for vision](#)
- GitHub, basic networking
- Adobe Photoshop and Premier, VSDC Editor
- Arduino and Raspberry Pi
- [Creo, Inventor, AutoCAD for CAD software](#)

***AWARDS AND CERTIFICATES*****2021****Team:**

- Led 81208X, won the Amaze Award and Skills 2<sup>nd</sup> Place at the 2021 Ontario Provincial Championships, qualifying the team to the 2021 VEX World Championships taking place on May 16<sup>th</sup>-20<sup>th</sup> 2021
- Led 81208X, won three VEX VRC Skills Champions at regional qualification tournaments, ranked 1<sup>st</sup> place globally

**2020****Personal:**

- DECA Provincial Champion for Innovation Business Plan, qualified to the 2020 DECA World ICDC Championships (cancelled due to COVID-19)
- Certificate of Distinction for the 2020 CSMC Math Contest
- Global Finalist for the Vex Annotated Programming Skills Video Submission
- SHAD 2020 Alumni

**Team:**

- Led 81208X, won the Create Award at the 2020 Vex Ontario Provincial Championships, qualified to the 2020 VEX World Championships ranking 39<sup>th</sup> in the High School division
- Led FIRST Tech Challenge team 16488 from St. Robert CHS to win the Inspire Award at the 2020 FTC Ontario Championships, qualified the team to the 2020 FTC World Championships

## 2019

### Team:

- Led the Robotics Team from St. Robert CHS representing York Catholic DSB, competed at the Ontario Skills Challenge, ranked 2<sup>nd</sup> programming and 5<sup>th</sup> overall
- Led VRC team 81208X to win the Judges Award at the St. Michaels Regional, qualified to compete at the VEX Ontario Provincial Championships

## 2018

### Personal:

- Silver Award at the 2018 York Region Science and Technology Fair
- First Place video production in the *Many Face of Markham* Art Contest

### Team:

- Founder and captain of VEX Robotics Competition team 81208X LeRoi Robotics, led team to win the Excellence Award at the Toronto Regional

## **WORK EXPERIENCE**

### **Developer Assistant, Dr. Robot Inc.**

Apr. 2020 - Present

- Provided suggestions on mechanical improvement
- Enhanced the mechanism's build quality

### **Counsellor, STEAM Program for Youth**

Jul. - Sep. 2020

- Edited the curriculum and hosted demos
- Worked as Instructor Assistant throughout the lessons and work periods
- Assessed the performance of the students

### **Assistant, STEAM Program for Youth**

Jun. - Sep. 2019

- Hosted workshops to teach robotics building and programming skill
- Arranged robotic competitions
- Organized outreach activities and assisted in marketing aspects

### **Teaching Assistant, Dr. X Academy**

Jun. - Sep. 2018

- Taught fundamentals of robotics designing and building skill
- Created presentation material and managed entire teaching procedure
- Provided mentorship to students who were additionally interested in STEM

## **ACTIVITIES & INTERESTS**

- Varsity Tennis Team of ST. Robert CHS Sep. 2017 - Nov. 2017
- Alpine Skiing/Night Fly Skiing Club of St. Robert CHS Sep. 2017 - Jun. 2019
- Piano RCM Level 10 Aug. 2019
- Alto Saxophone RCM Level 5 Nov. 2019
- Led Alto in Senior Concert and Senior Jazz bands of St. Robert CHS Sep. 2017 – Apr. 2020